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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

VIGUSHIN, J

ART UNIT	PAPER NUMBER
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2841

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DATE MAILED: 10/19/00

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 10

Application Number: 09/004,524

Filing Date: January 08, 1998

Appellant(s): Ronald W. Gedney

Tamar A. Powers (formerly Tamar A. Sholtes)

MAILED  
OCT 19 2000  
RECEIVED

William N. Hogg  
For Appellant

**EXAMINER'S ANSWER**

This is in response to appellant's brief on appeal filed July 31, 2000.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

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The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by-or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

No amendment after final has been filed.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claims 22-25 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

No prior art is relied upon by the examiner in the rejection of the claims under appeal.

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**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claims 21-25 and 34 are rejected under 35 U.S.C. 251. This rejection is set forth in prior Office action, Paper No. 7 dated March 02, 2000.

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**(11) Response to Argument**

(I). In the Arguments that follow, the current Examiner of record will refer to himself throughout as "the present Examiner." Primary Examiner Donald A. Sparks, who was the Examiner of record of the 07/848,467 Application (now US Patent 5,483,421) and is the author of the non-final rejection (Paper No. 5) in the instant Reissue Application 09/004,524, will be referenced throughout as "Examiner Sparks." The above-cited 07/848,467 will be hereinafter referenced as "Application '467."

(II). In reviewing the prior Office Action of the instant Reissue Application 09/004,524 (Paper No. 7) and in reading the Appellants' Appeal Brief arguments, the present Examiner now realizes that the presence, in reissue Claims 21 and 34, of the limitation of **"an encapsulation material encapsulating said first set of solder connections"** has no bearing on the matter of recapture now before the Board. The present Examiner believes that both he and the Appellants have been pursuing the wrong line of argument in **comparing the reissue Claims 21 and 34 to Claims 1 and 7 as originally filed in Application '467.** The fact that Claims 21 and 34 are **narrower compared to the originally filed Claims 1 and 7** (in the aspect of **the above-cited encapsulation material**), and **broader compared to the amended (patented) Claims 1 and 7** (in the aspect of both the specific chip carrier material, i.e., the **glass filled epoxy**, and the range of coefficients of thermal expansion of the chip carrier, i.e., **at least  $17 \times 10^{-6}$  ppm/°C**) has no relevance to the recapture issue as it applies to Claims

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**21-25 and 34 of the instant reissue Application 09/004,524 now before the Board.** This will be made clear in the arguments presented below.

(III). The sole issue upon which recapture depends in the instant Reissue Application is the **broadening** of the *patented* claims of Application '467 in aspects that were vigorously argued by the Appellants, with agreement by the Board, as patentable over the prior art of record in Application '467 and therefore *germane to the prior art rejection*, as has already been indicated in the recapture rejection by the present Examiner on pp.4 (bottom two lines) - 6 of the above-cited prior Office Action (Paper No. 7).

(IV). A review of the prosecution history will be beneficial in clarifying the present Examiner's above-cited position that Claims 21-25 and 34 are properly rejected as recapturing surrendered subject matter under 35 USC § 251:

1. Examiner Sparks rejected Claims 1-12 as originally filed in Application '467 (Paper No. 3 dated February 22, 1993) under 35 USC § 103(a) relying on Soga et al. (US 4,825,284) in view of Frankeny et al. (US 5,065,227).

2. In response to the above-cited rejection by Examiner Sparks of originally filed Claims 1-12, the Appellants amended the claims to include the following new limitations added to base Claims 1 and 7 (See Application '467, Paper No. 4: Amendment filed May 26, 1993):

- (1) "a chip carrier formed of an organic **glass filled epoxy material.**"

(bold emphasis by the present Examiner of Appellants' added limitation).

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(2) **"said chip carrier having a coefficient of thermal expansion of at least  $17 \times 10^{-6}$  ppm/C°."**

(3) **"an encapsulation material encapsulating said first set of solder connections."**

3. The Appellants argued that these features patentably defined over the prior art rejection of Examiner Sparks in their Amendment filed May 26, 1993 (see Application '467, Paper No. 4, p.10). Specifically, the Appellants argued that (bold emphasis by the present Examiner):

**"The applicant's invention utilizes a glass filled epoxy substrate having a thermal coefficient of expansion [referenced as "TCE" or "CTE"] greater than  $17 \times 10^{-6}$  ppm/°C as a chip carrier with a chip mounted thereon by solder interconnections which are then encapsulated. This carrier is then mounted to a similar substrate with solder ball connections. Indeed, in view of the great difference in CTE's between the semiconductor chip and that of the glass filled epoxy circuit board materials, there is nothing in Soga et al. that would suggest the technique described in great detail to reinforcing solder connections between chips and ceramics that could be extended to reinforce or strengthen solder ball interconnects between a chip and a glass filled epoxy substrate having a TCE much greater than, i.e., up to twice, that of the ceramic. Soga et al. teach a carrier of ceramic of a TCE of  $10-15 \times 10^{-6}$  ppm/°C not a material having a TCE over  $17 \times 10^{-6}$  ppm/°C. Thus, it is believed that Soga et al. clearly does not teach or suggest the present invention.**

**"The combination therewith of Frankeny et al. does not overcome this deficiency. Frankeny et al. does not teach mounting a chip on a glass filled epoxy carrier. While it is true that Frankeny et al. does say the carrier can be any substrate to allow direct chip attachment, there is no indication that it can be a glass filled epoxy board with the high CTE attendant thereto and which is claimed herein."**

4. Examiner Sparks responded with a new ground of rejection (see Application '467, Paper No. 5 dated June 29, 1993) necessitated by the above-cited amended claims under

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35 USC § 103(a) relying on Applicant's admitted prior art in view of Ushifusa et al. (US 4,821,142) and Ogihara et al. (EP 0 337 686 A2).

5. The Applicant submitted an After Final Response (see Application '467, Paper No. 6 dated September 16, 1993, pp.1-2) in which they argued the new grounds of rejection by Examiner Sparks of the above-cited amended Claims 1 and 7 as follows (bold emphasis by the present Examiner):

"The Examiner specifically states as directed to Claims 1 and 7, that the applicants' description of the general state of the art distinguishes the invention claimed in three aspects. Firstly, **the prior art does not teach making a chip carrier from organic glass-filled epoxy material having a coefficient of thermal expansion of at least  $17 \times 10^{-6}$  ppm/°C**, and the prior art does not teach using a circuit board having a similar co-efficient of thermal expansion as the chip carrier. Applicants respectfully disagree with the Examiner's characterization of the applicants' position. First, applicants acknowledge that chip carriers and circuit boards have been made of ceramic having similar coefficients of thermal expansion. **What applicants do claim is that nobody has disclosed forming a chip carrier of organic glass filled material and a circuit board formed of an organic material to that of the chip carrier and, moreover, that the carrier has a coefficient of thermal expansion of at least  $17 \times 10^{-6}$  ppm/°C** and joining an organic chip carrier to an organic board with solder connections. It is respectfully submitted that the newly-cited references do not teach such a concept, either alone or in any reasonable combination."

6. Appellants filed an Appeal Brief on December 02, 1993 (see Application '467, Paper No. 9) sending Application '467 to the Board of Patent Appeals and Interferences (hereinafter, "the Board") and the Board reversed Examiner Sparks' rejection, siding with the Appellants' arguments. The relevant excerpts of the Board decision (see Application '467, Paper No. 16 dated June 14, 1995) were cited in the prior Office Action (pp.5-6) and are reproduced for convenience below:



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Page 5, lines 6-8 of the Decision on Appeal

*"...The deficiency of Ushifusa is that the CTE of the chip carrier and circuit board are disclosed to be in the range of  $7-13 \times 10^{-6}$  ppm/°C, whereas claim 1 specifically recites the CTE of these two elements to be at least  $17 \times 10^{-6}$  ppm/°C..."*

Pages 6 and 7 of the Decision on Appeal

*"...The bottom line in attempting to combine the teachings of Ushifusa with Europe '686 is that Ushifusa suggests that the solder joint between the chip carrier and the chip itself would never be able to withstand a chip carrier having a CTE of at least  $17 \times 10^{-6}$  ppm/°C..."*

Page 8, lines 2-4 of the Decision on Appeal

*"...Based upon the evidence before us, there is no suggestion to make the chip carrier and circuit board out of material having a CTE of at least  $17 \times 10^{-6}$  ppm/°C..."*

7. Following the Board decision, the above-cited amended claims were allowed and Application '467 matured into US Patent No. 5,483,421.

(V). From the above summary of the prosecution history the Examiner notes the following important facts:

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(i) The Appellants twice argued the above-cited three limitations, especially a glass filled epoxy carrier having a CTE of at least  $17 \times 10^{-6}$  ppm/°C, as the features which patentably define over the prior art of record relied upon or cited by Examiner Sparks throughout the prosecution of Application '467.

(ii) The Board agreed with the Appellants and further supported the Appellants' argued grounds for patentability.

(VI). Presently, the Appellants have pending a Reissue Application (No. 09/004,524) wherein reissue Claims 21-25 and 34 are broader than the patented Claims 1-12 of Application '467 in two aspects that are germane to the prior art rejection. Specifically, reissue Claims 21 and 34 are recitations of patented Claims 1 and 7 of Application '467 minus the limitations of the "glass filled epoxy" carrier material and the requirement that the carrier have a CTE of "at least  $17 \times 10^{-6}$  ppm/°C."

(VII). Clearly, in Claims 21 and 34, the Appellants are attempting to recapture subject matter surrendered by amendment during the prosecution of Application '467. Specifically, the Appellants are trying to recapture "*a chip carrier formed of an organic dielectric material*" and "*a circuit board formed of an organic material having a coefficient of thermal expansion similar to the chip carrier*" wherein the chip carrier is not limited to the glass filled epoxy material of the *patented* claims, and the coefficient of thermal expansion of the chip carrier is not limited to the specified range of values, i.e., at least  $17 \times 10^{-6}$  ppm/°C, of the *patented* claims.

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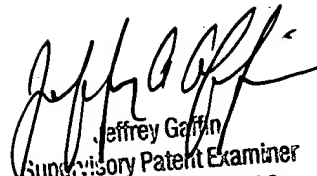
(VIII). The Appellants are thus broadening the **patented** claims of Application '467 in two aspects germane to the prior art rejection (i.e., the **glass filled epoxy** and **CTE of at least  $17 \times 10^{-6}$  ppm/°C** of the chip carrier). These above-cited two aspects were not only vigorously argued by the Appellants as critical to the patentability of the claims over the prior art of record, but the Board further supported and reiterated the Appellants' patentability arguments. Therefore, the Appellants' Claims 21-25 and 34 of the instant Reissue Application 09/004,524, as broadened vis-à-vis the **patented** claims of Application '467, are clearly in violation of the recapture rule under 35 USC § 251 as set forth in the guidelines for determining recapture by the *Clement* court (*In re Clement*, (CAFC) 45 USPQ2d 1161).

(IX). Regardless of whether or not the "**encapsulation material**" limitation in reissue Claims 21-25 and 34 is or is not a patentable feature of the claims, the attempt to recapture the surrendered subject matter as discussed in paragraph (VII), above, precludes examination of Claims 21-25 and 34 on the merits and requires the rejection of Claims 21-25 and 34 under 35 USC § 251.

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(X). For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
Jeffrey Galpin  
Supervisory Patent Examiner  
Technology Center 2800


Vigushin/jbv  
October 18, 2000

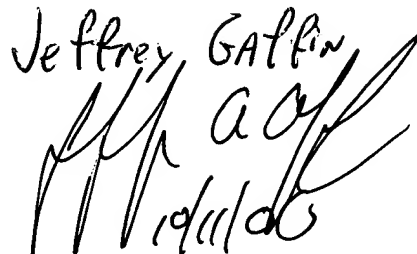
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Appeal Conference conducted on October 11, 2000.

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